

this and Dynamic Data

Section 7.5 and 7.6

this Pointer

- Every object has a special pointer
- It is implicitly passed with every object
- It is used implicitly when you reference a private data member inside of a class's method
- You can explicitly use it if you choose or need

Using a pointer to reference Components of a class

```
class Test
{
public:
    Test(int = 0);
    void print() const;
private:
    int x;
};
```

```
Test::Test (int value) : x(value) { }
void Test::print() const
{
    cout << "    x = " << x;
    cout << "\n    this->x = " << this->x;
    cout << "\n    (*this).x = " << (*this).x;
    cout << "\n';
}
```

```
int main()
```

```
{
```

```
    Test testobject( 12 );
```

```
    testObject.print();
```

```
    return 0;
```

```
}
```

```
    x = 12
```

```
    this->x = 12
```

```
    (*this).x = 12
```

(*somePtr).someComponent

- This style is used so much, we use the arrow instead
- somePtr->someComponent
- The symbol is a minus sign and a greater than sign and called "arrow"
- You use this when ever you have a pointer to a class
- Like with dynamic data

Dynamic Data ☺

- The programmer can if they wish create an object dynamically.
- Meaning rather than using memory given to the program when it begins and resides in its memory space
- You can get it from the system heap.

Syntax

- You use the command `new`
- `Time *timePtr;`
- `timePtr = new Time;`
- `new` returns a pointer to the memory allocated for the newly created object of type `Time`.
- `#include <new>` to use the new standard

More examples

- You can do this for any built-in or user-defined type
- `int *xPtr = new int;`
- You can also create an array this way
- `int xArrayPtr = new int [10];`
- This creates an array of size ten and you access it through `xArrayPtr`

Freeing memory

- To release the memory pointed to by your pointer you use the command `delete`
- `delete xPtr;`
- `delete [] xPtr;`
- Forgetting the `[]` on an array only releases the memory for the first location in the array

Group Activity

- Remember the class you are writing for HW?
- (yes)?
- Write a main program that uses three dynamically created objects to test the functionality of your class.